

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of: Ajit P. Paranjpe et al.
Serial No.: 09/864,714
Date Filed: May 23, 2001
Group Art Unit: 2814
Examiner: Rao, Shrinivas H.
Title: *Atomic Layer Deposition for Fabrication Thin Films*

Mail Stop RCE
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I hereby certify that this Information Disclosure Statement is being deposited with the United States Postal Service as Express Mail No. **EV351284446US** addressed to: Mail Stop RCE, Commissioner for Patents, Alexandria, VA 22313-1450, on February 22, 2005


Angela Loding

Dear Sir:

INFORMATION DISCLOSURE STATEMENT


Applicants respectfully request, pursuant to 37 C.F.R. §§1.56, 1.97, and 1.98, that the references listed on the attached PTO-1449 form be considered and cited in the examination of the above-identified application. Copies of the references are enclosed for the convenience of the Examiner.

Furthermore, pursuant to 37 C.F.R. §§1.97 (g) and (h), no representation is made that these references are material to the patentability of the present application.

Applicants believe no fees are due, however, the Commissioner is hereby authorized to charge any additional fees or credit any overpayments to Deposit Account No. 50-2148 of Baker Botts L.L.P. in order to effectuate this filing.

Respectfully submitted,

BAKER BOTTS L.L.P.
Attorneys for Applicants


Paula D. Heyman
Reg. No. 48,363

Date: Feb. 22, 2005

Correspondence Address:

Customer No. **31625**

512.322.2581

512.322.8328 (Fax)

PTO-1449 Information Disclosure Citation in an Application	Application No. 09/864,714	Applicant(s) Ajit P. Paranjpe et al.	
	Docket Number 021208.0238	Group Art Unit 2814	Filing Date May 23, 2001

U.S. PATENT DOCUMENTS

	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
A.	6174377	1/16/2001	Doering et al.	118	729	1/4/99
B.	5879459	3/09/1999	Gadgil et al.	118	715	8/29/97
C.	5916365	6/29/1999	Sherman	117	92	8/16/96
D.	6015590	1/18/2000	Suntola et al.	427	255.23	09/25/96
E.	6200893	3/13/2001	Sneh	438	685	3/11/99
F.	6342277	1/29/2002	Sherman	427	562	4/14/99
G.	2002/0041931	4/11/2002	Suntola et al.	427	255.28	5/14/01
H.	6387185	5/14/2002	Doering et al.	118	729	1/16/01
I.	6391785	5/21/2002	Satta et al.	438	704	8/23/00
J.	6416577	7/9/2002	Suntola et al.	117	88	06/07/00
K.	2002/0106846	8/8/2002	Seutter et al.	438	200	2/2/01
L.	2002/0108570	8/15/2002	Lindfors	118	715	4/16/01
M.	6447607	9/10/2002	Soininen et al.	117	200	12/27/00
N.	6451119*	9/17/2002	Sneh et al.	118	715	11/29/00
O.	6451695	9/17/2002	Sneh	438	685	12/22/00
P.	6464779	10/15/2002	Powell et al.	117	89	1/19/01
Q.	6475910	11/5/2002	Sneh	438	685	9/22/00
R.	6475276	11/5/2002	Elers et al.	117	84	10/13/00
S.	6482262	11/19/2002	Elers et al.	117	84	10/13/00
T.	6482740	11/19/2002	Soininen et al.	438	686	5/15/01

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
U.	62221102	09/29/1987	JP (with English abstract)	H01F	41/14		X
V.	WO 00/38191	06/29/2000	PCT	G11C	11/15	X	

NON-PATENT DOCUMENTS - DOCUMENT (Including Author, Title, Source, and Pertinent Pages)

W.	Addison, C.C. et al. "The Vapour Pressure of Anhydrous Copper Nitrate, and its Molecular Weight in the Vapour State", <i>J. Chem. Soc.</i> , pp. 3099-3106	1958
X.	Akerman, J.J et al., "Identifying Tunneling in Ferromagnetic-Insulator-Ferromagnetic Thin Film Structures", World-wide web, physics.ucsd.edu/iksgp/Tunneling.html, pp. 1-6,	Printed 02/04/2002
Y.	Bobo, J.F. et al., "Spin-dependent Tunneling Junctions with Hard Magnetic layer Pinning", <i>Journal of Applied Physics</i> , vol. 83, No. 11, pp. 6685-6687	1998
Z.	Daughton, J.M., World-wide web nve.com/otherbiz/mram2.pdf, "Advanced MRAM Concepts", pp. 1-6	02/07/2001

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

U.S. Patent and Trademark Office

AUS01:367780.1

PTO-1449 Information Disclosure Citation in an Application	Application No.	Applicant(s)	
	09/864,714	Ajit P. Paranjpe et al.	
	Docket Number	Group Art Unit	Filing Date
	021208.0238	2814	May 23, 2001

U.S. PATENT DOCUMENTS

	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
A.	2002/0187084	12/12/2002	Lindfors et al.	422	177	7/24/02
B.	6503330	1/7/2003	Sneh et al.	118	715	12/22/99
C.	6506352	1/14/2003	Lindfors et al.	423	240	7/20/00
D.	6511539	1/28/2003	Raaijmakers	117	102	9/8/99
E.	6524952	2/25/2003	Srinivas et al.	438	649	6/20/00
F.	6540838	4/1/2003	Sneh et al.	118	715	6/28/02
G.	6548424	4/15/2003	Putkonen	438	785	4/16/01
H.	6551406	4/22/2003	Kilpi	118	728	12/27/00
I.	6562140	5/13/2003	Bondestam et al.	118	715	5/10/00
J.	2003/0096468	5/22/2003	Soininen et al.	438	200	11/19/02
K.	6572705	6/3/2003	Suntola et al.	118	702	1/14/00
L.	2003/0101927	6/5/2003	Raaijmakers	117	200	12/10/02
M.	6579374	6/17/2003	Bondestam et al.	118	725	1/25/01
N.	2003/0121469	7/3/2003	Lindfors et al.	117	105	10/11/02
O.	6599572	7/29/2003	Saaniila et al.	427	249.18	1/18/01
P.	2003/0140854	7/31/2003	Kilpi	118	715	2/13/03
Q.	6602784	8/5/2003	Sneh	438	680	8/6/02
R.	2003/0150385	8/14/2003	Bondestam et al.	118	722	3/6/03
S.	6616986	9/9/2003	Sherman	427	562	10/9/01
T.	6620723	9/16/2003	Byun et al.	438	627	6/27/00
U.	6627268	9/30/2003	Fair et al.	427	533	5/3/01

FOREIGN PATENT DOCUMENTS

	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
V.	WO 02/09126	01/31/2002	PCT	H01F	10/32	X	
W.	W 02/09158	01/31/2002	PCT	H01L	21/00	X	

NON-PATENT DOCUMENTS - DOCUMENT (Including Author, Title, Source, and Pertinent Pages)

X.	Fereday, R.J. et al., "Anhydrous Cobalt (III) Nitrate", <i>Chemical Communications</i> , pp. 271	1968
Y.	Hsaio, R., "Fabrication of Magnetic Recording Heads and Dry Etching Head Materials", <i>IBM Journal of Research and Development</i> , vol. 43, (1/2):1999, pp. 89-102	1999
Z.	Imai, Takuji, world-wide-web.nikkeibp.asiabiztech.com/nea/200008/tech_108675.html , "100 Gbit/Inch HDD Just Around the Corner", pp. 1-6	08/2000

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

PTO-1449 Information Disclosure Citation in an Application	Application No.	Applicant(s)	
	09/864,714	Ajit P. Paranjpe et al.	
	Docket Number	Group Art Unit	Filing Date
	021208.0238	2814	May 23, 2001

U.S. PATENT DOCUMENTS

		DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE
	A.	2003/0183171	10/2/2003	Sneh et al.	118	724	3/27/03
	B.	6630401	10/7/2003	Sneh	438	680	8/6/02
	C.	6630030	10/7/2003	Suntola et al.	118	728	1/4/00
	D.	6632279	10/14/2003	Ritala et al.	117	101	10/13/00
	E.	6635965	10/21/2003	Lee et al.	257	758	10/9/01
	F.	6638862	10/28/2003	Sneh	438	685	8/6/02
	G.	6638859	10/28/2003	Sneh et al.	438	680	9/27/02
	H.	6638810	10/28/2003	Bakli et al.	438	240	11/5/01
	I.	6652924	11/25/2003	Sherman	427	576	5/24/01
	J.	6660126	12/9/2003	Nguyen et al.	156	345.34	3/2/01
	K.	6664192	12/16/2003	Satta et al.	438	704	4/15/02
	L.	2004/0005753	1/8/2004	Kostamo et al.	438	222	3/20/03
	M.	2004/0007171	1/15/2004	Ritala et al.	117	89	7/10/03
	N.	6679951	1/20/2004	Soininen et al.	148	240	11/13/01
	O.	6689210	2/10/2004	Soininen et al.	117	89	7/24/02
	P.	6720260	4/13/2004	Fair et al.	438	680	6/20/03
	Q.	2004/0076837	4/22/2004	Hein et al.	428	446	10/22/02
	R.	2004/0076751	4/22/2004	Sherman	427	255.34	10/10/03
	S.	6727169	4/27/2004	Raaijmakers et al.	438	622	8/23/00
	T.	2004/0083949	5/6/2004	Sherman	117	84	10/22/03
	U.	6734020	5/11/2004	Lu et al.	436	55	3/7/01
	V.	2004/0121616	6/24/2004	Satta et al.	438	778	12/8/03
	W.	6759081	7/6/2004	Huganen et al.	427	58	4/30/02
	X.	2004/0130029	7/8/2004	Raaijmakers et al.	257	758	12/15/03

FOREIGN PATENT DOCUMENTS

		DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
							YES	NO
	Y.	WO 01/88972	11/22/2001	PCT	H01L	21/321	X	

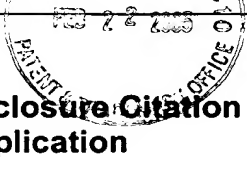
NON-PATENT DOCUMENTS - DOCUMENT (Including Author, Title, Source, and Pertinent Pages)

	Z.	Nilsen, O et al, "Thin Film Deposition of lanthanum Manganite Perovskite by the ALE Process", <i>Journal of Materials Chemistry</i> , vol. 9, pp. 1781-1784.					1999
--	----	--	--	--	--	--	------

EXAMINER

DATE CONSIDERED

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

 Information Disclosure Citation in an Application		Application No.		Applicant(s)	
		09/864,714		Ajit P. Paranjpe et al.	
		Docket Number		Group Art Unit	Filing Date
		021208.0238		2814	May 23, 2001

U.S. PATENT DOCUMENTS							
	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE	
A.	6764546	7/20/2004	Raaijmakers	117	93	12/10/02	
B.	6767582	7/27/2004	Elers	427	253	10/12/00	
C.	6777353	8/17/2004	Putkonen	438	785	4/8/03	
D.	2004/0161636	8/19/2004	Hujanen et al.	428	692	2/17/04	
E.	6794287	9/21/2004	Saanila et al.	438	674	3/20/03	
F.	6800173	10/5/2004	Chiang et al.	156	345.33	7/9/01	
G.	6800552	10/5/2004	Elers et al.	438	680	9/17/02	
H.	2004/0202786	10/14/2004	Wongsenakhum et al.	427	250	3/31/04	
I.	6811814	11/2/2004	Chen et al.	427	248.1	1/16/02	
J.	6818067	11/16/2004	Doering et al.	118	715	4/15/02	
K.	6821889	11/23/2004	Elers et al.	438	680	7/30/02	

FOREIGN PATENT DOCUMENTS							
	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
L.							

NON-PATENT DOCUMENTS - DOCUMENT (Including Author, Title, Source, and Pertinent Pages)				
M.	Pakrad, C.D., "Pure Tech: Growth of MR/GMR Head Materials," World-wide web, puretechinc.com/tech_papers/tech_papers-4.htm, pp. 1-2			1999
N.	Riihela et al., "Low Temperature Deposition of AlN Films by an Alternate Syppy of Trimethyl Aluminum and Ammonia" Chemical Vapor Deposition, 2 (6): pp. 277-283.			1996
O.	Suntola, Tuomo; <i>Handbook of Crystal Growth</i> , vol. 3, Thin Films and Epitaxy, Part B: Growth Mechanisms and Dynamics, Chapter 14, pp. 601-663, Hurler, ed. Elsevier Science B.V.			1994
P.	Ritala et al., "Atomic Layer Epitaxy-a Valuable Tool for Nanotechnology?" Nanotechnology vol. 10, pages 19-24			1999
Q.	Wang, Shan X., "Advanced Materials for Extremely High Density Magnetic Recording Heads," Department of Electrical Engineering, Stanford University, Stanford, CA 94305-4045, presentation.			no date available
R.	World-wide web, megahaus.com/tech/westerndigital/shitepapers/gmr_wp.shtml, "GMR Head Technology: Increased Areal Density and Improved Performance Areal Density," pp. 1-4.			02/2000
S.	World-wide web, semiconductor.net/semiconductor/issues/Issues/1998/feb98/docs/emerging.asp, "GMR Read-Write Heads Yield Data Storage Record," pp. 1-2.			02/1998
T.	World-wide web, stoner.leeds.ac.uk/research/gmr.htm, "Giant Magnetoresistance (GMR) Heads", pp. 1-6.			Printed 02/04/2002
U.	World-wide web, pcguide.com/ref/hdd/op/heads/techGMR-c.html, "Giant Magnetoresistive (GMR) Heads", pp. 1-4.			Printed 12/18/2004
A.	Utriainen, et al., "Studies of Metallic Film Growth in an Atomic Layer Epitaxy reactor Using M(acac) ₂ (M=Ni, Cu, Pt) Precursors", <i>Applied Surface Science</i> , vol. 157, pp. 151-158.			2000
V.	Ueno et al., "Cleaning of CHF ₃ , plasma-etched SiO ₂ /SiN/Cu via Structures Using a Hydrogen Plasma, an Oxygen Plasma and Hexafluoroacetylacetone Vapors," <i>J. Vac. Sci. Technology B</i> , vol. 16, No. 6, pp. 2986-2995.			Nov./Dec. 1998

EXAMINER	DATE CONSIDERED
----------	-----------------

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.

PTO-1449 Information Disclosure Citation in an Application		Application No.		Applicant(s)	
		09/864,714		Ajit P. Paranjpe et al.	
		Docket Number		Group Art Unit	Filing Date
		021208.0238		2814	May 23, 2001

U.S. PATENT DOCUMENTS							
	DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS	FILING DATE	
A.	5647911	07/15/97	Vanell et al.	118	715	12/14/93	
B.	5711811	01/27/98	Suntola et al.	118	711	11/28/95	
C.	5916369	06/29/99	Anderson et al.	118	715	06/07/95	
D.	2003/0003635 A1	01/02/03	Paranjpe et al.	438	149	05/23/01	
E.							
F.							
G.							
H.							
I.							
J.							

FOREIGN PATENT DOCUMENTS							
	DOCUMENT NO.	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
K.							

NON-PATENT DOCUMENTS - DOCUMENT (Including Author, Title, Source, and Pertinent Pages)		
L.	Omstead, Thomas, et al.; "Filling High-AR Structures Using Pulsed Nucleation Layer Deposition", Solid State Technology, Vol. 45, pp. 51-56.	09/2002
M.		
N.		
O.		
P.		
Q.		
R.		
S.		
T.		
U.		
V.		

EXAMINER	DATE CONSIDERED
----------	-----------------

EXAMINER: Initial if citation considered, whether or not citation is in conformance with MPEP § 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to the applicant.